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10/582,524	04/05/2007	Thomas N. Horsky	211843-00047	1041

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KATTEN MUCHIN ROSENMAN LLP
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WASHINGTON, DC 20007-5118

EXAMINER

SOUW, BERNARD E

ART UNIT	PAPER NUMBER
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2881

MAIL DATE	DELIVERY MODE
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03/03/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/582,524

Applicant(s)

HORSKY ET AL.

Examiner

BERNARD E. SOUW

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/29/2008 (Amdt).
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 28-66 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 28-66 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 February 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Amendment

1. The Amendment filed on 12/29/2008 has been entered. The present Office Action is made with all the suggested amendments being fully considered.

The specification has been amended.

Claims 2-27 have been cancelled.

New claims 28-66 have been previously submitted.

Claims 1 and 28-66 are pending in this Office Action.

2. New figure drawings have been received.

They are replacements figure drawings with changes denoted by red circles.

However, the indicated red circles indicating the changes made, are not visible.

Terminal Disclaimer

3. The terminal disclaimer filed on 12/23/2008 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of 11/648,365 has been reviewed and is accepted on 1/14/2009. The terminal disclaimer has been recorded.

Double Patenting Rejection Withdrawn

4. This application has been previously rejected provisionally under 35 U.S.C. 101 over US Application No. 11/535/725. However, since the reference application has been so amended such that Statutory Double Patenting is no longer applicable, the previous Double Patenting rejection of Claim 1 under 35 U.S.C. 101 is herewith withdrawn.

New Double Patenting Rejection

Non-Statutory Type Double Patenting

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent

and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Obviousness Type Double Patenting

6. Claim 36 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over a combination claim 1 of US Application No.11/648,365, as applied previously, and claim 2 of U.S. Patent No. **6,744,214**. Although the conflicting claims are not identical, they are not patentably distinct from each other because:

The “*gate valve*” recited in present claim 36 is the same as the “*gate valve*” recited in the reference claim 2.

7. Claim 44 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over a combination claim 1 of US Patent Application No.11/648,365, as applied previously, and claim 1 of U.S. Patent

No. **6,452,338** and also with claim 1 of US Patent No. **6,744,214**, specifically with regard to the limitation of an ion source.

8. Claim 45 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over a combination claim 1 of US Patent Application No.11/648,365, as applied previously, with claim 3 of U.S. Patent No. **6,452,338**, and also with claim 3 of US Patent No. **6,744,214**, specifically with regard to the limitation of an ion implanter.

9. Claim 50 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over a combination claim 1 of US Application No.11/648,365, as applied previously, and claim 2 or claim 13 of U.S. Patent Application No. **10/519,699**. Although the conflicting claims are not identical, they are not patentably distinct from each other because:

The "*decaborane*" recited in present claim 50 is the same as the "*decaborane*" recited in the reference claim 2 or claim 13.

10. Claim 51 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over a combination claim 1 of US Application No. 11/648,365, as applied previously, and claim 6, or claim 7, or claim 25, or claim 26, or claim 34 of U.S. Patent Application No. **11/452,003**. Although the

conflicting claims are not identical, they are not patentably distinct from each other because:

The "octadecaborane" recited in present claim 51 is the same as the "octadecaborane" recited in the reference claim 6, 7, 25, 26, or 34.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1,148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 1, 28-43, 48-51 and 55-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sandhu. (USPAT 6,701,066).

► Regarding claims 1 and 55, Sandhu teaches vapor delivery system 100 shown in Fig.1 for delivering a controlled flow of vapor 114 sublimated from a solid material 112 to a vacuum chamber, the vapor delivery comprising:

- a combination of a heated vaporizer 108 for the solid material 112 operable at sub atmospheric pressure, the vaporizer 108 having a vaporizer heater control system 112 for controlling the heat applied to the vaporizer, as recited in col.3/ll.33-42; and
- a vapor delivery passage (120,122) from the vaporizer 108 to a vacuum chamber 124, the vapor delivery passage including a throttle valve 138 followed by a vapor conduit 122 and a pressure sensor gauge 142 that is responsive to sub atmospheric pressure in the vapor conduit 122 being located between downstream of the throttle valve 138 (as recited in col.4/ll.16-25 & 38-53) and a temperature control system 146 for controlling the temperature of the surfaces 106 of the vapor delivery passage 122 that are exposed to the sublimed vapor 114, including such surfaces of the throttle valve 138, the pressure gauge 142 and the vapor conduit (120,122) being adapted to be held at temperature above the condensation temperature of the solid material 112, and a closed-loop (i.e., feedback) control system 118 (or 140) responsive to the pressure gauge sensor 142, the closed loop control system 118 (or 140) configured to vary the

conductance of the throttle valve 138 (as expressly recited in col.4/ll.47-48) to control the sub atmospheric pressure of the vapor downstream of the throttle valve 138 in response to the output of the pressure sensor 142, wherein the flow rate of vapor 114 to the vacuum chamber being determined as a function of the pressure of the vapor downstream of the throttling valve 138.

Although Sandhu fails to expressly recite by words the limitations of sub-atmospheric pressure in the vacuum chamber 124, this limitation is automatically understood by those skilled in the art in association with the vacuum pump 130, as implicated in col.4/ll.8-32.

Furthermore, the limitation of *"temperature above the condensation temperature of the solid material"* is inherently understood by those of ordinary skill in the art, since in order to sublime a solid material the temperature must be raised to above the condensation temperature.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to hold the solid material to a temperature above the condensation temperature of the solid material, in order to convert the solid material into its vapor.

One of ordinary skill in the art would have been motivated to convert the solid material into its vapor, so the vapor can be transported by conduit to the process chamber.

► Claim 55 is a method claim reciting the same features as claim 1. Therefore, claim 55 is also rejected along with claim 1 for the same reason and motivation.

► Regarding claim 28, Sandhu teaches a temperature controlling system 146 for holding the temperatures of the surfaces 106 of the delivery passages above the condensation temperature of the solid material, as recited in col.4/ll.1-15. It is well known in the art that a temperature of the delivery passages 120 and 122 (all the way to the processing chamber 124) must be held above the temperature of the vaporizer, in order to prevent the sublimated vapor from condensing on the surfaces of the delivery passages.

This general knowledge in the art is capable of instant and unquestionable demonstration (MPEP § 2144.03 (A)), and most importantly, supported by Technical Line of Reasoning (MPEP § 2144.03 (B)):

(A) Official notice unsupported by documentary evidence should only be taken by the examiner where the facts asserted to be well-known, or to be common knowledge in the art are capable of instant and unquestionable demonstration as being well-known. See *In re Ahlert*, 424 F.2d 1088, 1091, 165 USPQ 418, 420 (CCPA 1970); *In re Knapp Monarch Co.*, 296 F.2d 230, 132 USPQ 6 (CCPA 1961)). See also *In re Fox*, 471 F.2d 1405, 1407, 176 USPQ 340, 341 (CCPA 1973).

(B) If Official Notice Is Taken of a Fact, Unsupported by Documentary Evidence, the Technical Line of Reasoning Underlying a Decision To Take Such Notice Must Be Clear and Unmistakable. See *In re Soli*, 317 F.2d 941, 945-46, 137 USPQ 797, 800 (CCPA 1963); *In re Chevenard*, 139 F.2d 711, 713, 60 USPQ 239, 241 (CCPA 1943)

- ▶ Claim 29, reciting multiple stages of delivery passages 120, 122, to be held at progressively higher temperatures, is an obvious consequence of claim 28 under the official notice applied above.
- ▶ As per claim 30, Sandhu's vapor flow rate is adapted to be determined by both a control system for the temperature of the vaporizer and said control system for the conductance of the throttle valve, as recited in col.4/ll.1-15.
- ▶ Regarding claim 31, the limitation of the vaporizer temperature being determined by a closed loop control to a set-point temperature is implicitly recited in col.6/ll.66-67 & col.7/ll.1-5.
- ▶ Regarding claim 36, the limitation of a variable-position gate valve is taught by Sandhu in claim 31 and claim 45.
- ▶ The limitations of claims 39, 41 and 43 are conventional and already inclusive in Sandhu's control system, as recited in col.4/ll.38-67, col.5/ll.1-67, col.6/ll.1-67 and col.7/ll.1-12, wherein the specific use of a table is recited in col.7/ll.1-5.
- ▶ The limitation of a butterfly valve as throttle valve in claims 37, 40, 42 and 56 is a mere matter of design choice. In this case, Sandhu's conventional throttle valve seems to function satisfactorily, such that the specific use of a butterfly valve is a mere matter of design choice that --in the absence of any extraordinary result-- is basically not patentable for involving only routine skill in the art.

► Regarding claims 48 and 49, the use of a servo-loop to control the vapor pressure and temperature and adjust the throttle valve to maintain the downstream vapor pressure at a set-point value is taught by Sandhu, as recited in col.6/II.20-46.

► Claims 32-35, 38 and 57 recite specific limitations that are mere matter of design choice. In this case, Sandhu's apparatus seems to function satisfactorily using the undisclosed specific values of the conductance of the throttle valve, its operation pressure, and the ratio of the conductance to the conductance of the conduit, such that Applicant's specific values are mere matters of design choice, which --in the absence of any extraordinary result-- are basically not patentable for involving only routine skill in the art.

12. Claims 44-47 and 58-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sandhu in view of Wang et al. (USPAT 7,437,060).

Sandhu teaches all the limitations of claims 44-47, except the recitations of an ion source, ion implanter, work piece in processing chamber and process chamber for dosing semiconductor. These limitations are expressly taught by Wang et al., specifically in col.1/II.23-32 and col.1/II.59-67.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Sandhu's to process semiconductor work piece, e.g. implanting with dopant ions, in order to manufacture various semiconductor devices.

One of ordinary skill in the art would have been motivated to use implant ions into semiconductor wafers, in order to change the electrical properties according to the device desired.

► Claim 58 is a method claim reciting the same limitations as claim 44, claim 59 the same as claim 30, claim 60 the same as claim 56, claim 61 the same as claim 39, claim 62 the same as claim 41 and claim 63 the same as claim 45.

Consequently, claims 58-63, respectively, are rejected for the same reason and motivation as previously rejected claims 44, 30, 56, 39, 41 and 45, respectively.

► Claim 64 recites a control system reciting the same limitations as claim 39, claim 65 the same limitations as claim 41 and claim 66 the same limitations as claim 43.

Consequently, claims 64-66, respectively, are rejected for the same reason and motivation as previously rejected claims 39, 41 and 43, respectively.

Indication of Allowable Subject Matter

9. Claims 52, 53 and 54 are objected to as being dependent upon a rejected base claim, but would be allowable upon obviating the present rejection of the respective parent claims, or if rewritten to include all of the limitations of the base claim and any intervening claims.

Reasons for Indication of Allowable Subject Matter

10. The following is an examiner's statement of reasons for allowable subject matter:

Claims 52, 53 and 54 contain allowable subject matter for reciting the limitations of "*indium trichloride*", "*trimethyl indium*" and "*triethyl antimony*" in view of the submitted Terminal Disclaimer over US Application No.11/648,365.

Relevant Prior Art

11. This prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

USPAT 7,347,060 issued to Wang et al. teaches the same invention as Sandhu's. Therefore, Wang's can be applied as an equivalent substitute of Sandhu for rejecting claims 1-, either alone or in combination.

Communications

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard E Souw, whose telephone number is 571 272 2482. The examiner can normally be reached on Monday thru Friday, 9:00 am to 5:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on 571 272 2293. The central fax phone number for the organization where this application or proceeding is assigned is 571 273 8300 for regular communications as well as for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571 272 5993.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Bernard E Souw/
Primary Examiner, Art Unit 2881

02/25/2009